

FILES FOR THE FARM

NICHOLSON
U.S.A.
(TRADE MARK)

WHICH TO SELECT...

WHERE THEY ARE USED...

HOW TO USE THEM...

NICHOLSON FILE COMPANY, PROVIDENCE 1, R.I., U.S.A.

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CORVALLIS, OREGON



FILES FOR THE FARM . . .

A Guide to Time, Labor and Money Saving

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First Edition



FILES FOR THE FARM

THIS is the first edition of a booklet especially written to help those who own, manage and operate farms get more value out of files through more effective selection, use and care of them.

On the pages which follow you will find sections in which appropriate files for farm use are illustrated and described. You will look with interest, we hope, at the pictorial pages which show the applications which other farmers have found for our products. Finally, you will come to a technical part of the booklet in which our Research Department has made specific and carefully tested suggestions for the selection, use and care of files.

The preparation of helpful literature is part of the service of the conscientious manufacturer. For many years, we have performed that service through succeeding editions of our general booklet, "File Filosophy." Now we extend this service by offering you the first edition of our specialized booklet, "Files for the Farm."

We hope you will like it.

PERFECTION-MADE FILES

There is probably no single tool that costs so little, serves so widely, as does the Nicholson File. The high point of perfection, which has been achieved in its production, is due largely to the contributions made by the Nicholson File Company in the development of machinery utilized in modern file manufacture.

Today's Nicholson File is perfection-made, and available in a variety of over 3000 sizes and cuts. Volumes could be written to describe their endless use, but, for our purpose, we will confine the subject to "Files for the Farm". In their development, Nicholson File Company has devoted much time and research for over three quarters of a century.

SEVEN STEPS IN MAKING QUALITY FARM FILES

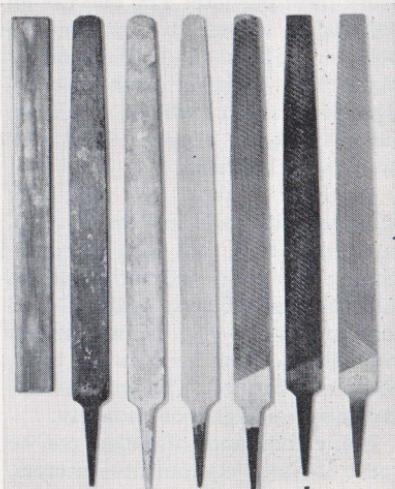
Quality in a file commences with the steel itself. Exacting specifications, rigidly maintained, set the standard for Nicholson file steel. Next follow the seven basic production steps, through which the file must pass from raw metal to finished product.

STEP NO. 1—STEEL, received in various widths, thicknesses and cross sections, is cut to the proper length for the finished product.

STEP NO. 2—ROUGH SHAPING—The blank is heated and then forged. Both the tang and the point are shaped in this manner, either by rolling or hammering.

STEP NO. 3—ANNEALING—The forged blank is heated to an elevated temperature and cooled slowly under closely controlled conditions to soften the steel and to make the internal structure uniform.

STEP NO. 4—FINAL SHAPING—The annealed blanks are either ground or milled to produce the finished shape. This is followed by drawfiling, which produces the perfectly true flat or curved surface necessary for the formation of the teeth.



Seven steps in making files

STEP NO. 5—FORMING OF TEETH—The teeth are formed by a rapidly reciprocating chisel that strikes successive blows on the file blank as it moves past the chisel. The hardened chisel cuts into the soft blank, displacing and raising the steel into the desired tooth structure.

STEP NO. 6—HARDENING—The files are heated in a molten lead bath to a closely controlled high temperature. This is followed by immersing the heated blank in a quenching solution.

This combination of heating and rapid cooling under closely controlled conditions brings the file to the maximum hardness to the very top of the cutting edges.

STEP NO. 7—FINISHING—The file is cleaned and sharpened by sandblast-ing. The tang re-heated to give it strength without brittleness. Having passed final inspection, the file is now a Nicholson File Company quality product, ready to perform its farm functions.

THE IMPORTANCE OF THE RIGHT TOOL FOR EVERY JOB

Here is an exaggerated example intended only to emphasize the importance of using the right tool for every farm purpose! You can use an adjustable wrench to remove the bolts on the head of a tractor's motor block, but, a socket wrench is designed for the job. It will do it quicker, easier, without slippage—and will protect the bolthead.

Further, a farm can be fully equipped with tools, and implements, but unless these are kept in condition, their number and variety are no indication of efficient usage. Edged tools must be re-edged. Saws must be kept sharp. New handles for tools, fitted and formed. The work of upkeep and repair goes on endlessly.

Many thousands of dollars can be spent in farm equipment—tractors, combines, mowers, manure spreaders, cultivators, plows, reapers—a long line of expensive machinery. From time to time, all require upkeep and

repair to do their work dependably, better, faster and, *again, to conserve your time*.

Whenever possible, a breakdown in any unit of today's mechanized farm equipment should be repaired *on the spot*, and the tools for such repair must be on hand and available so that farm work can continue with minimum interruption.

Farm lighting and water systems must be maintained in operation, the farm home and out-buildings kept in repair, and even the work which the village smithy used to do, finds its counterpart in many of today's farm worksheds. Thus, the progressive farmer, in addition to being a planter or cattle man, must be a mechanic, carpenter, plumber, electrician and tool expert, as well.

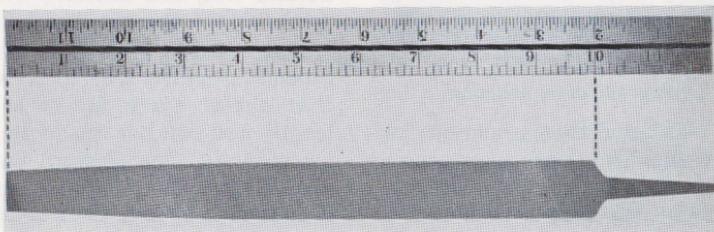
And, so we turn to files—the least expensive of all farm maintenance tools and in constant demand—*all over the farm!*

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IMPORTANT CHARACTERISTICS OF QUALITY FILES

There is a variety of file types which, when combined, might be termed a farm file kit or assortment. Among them, the exact file for every specific farm job is almost certain to be found. No farm should be without them. But, before discussing a list of files which should be found on every farm, it is best to understand the characteristic differences that distinguish one type of file from another. These are three in number—Length, Kind and Cut:



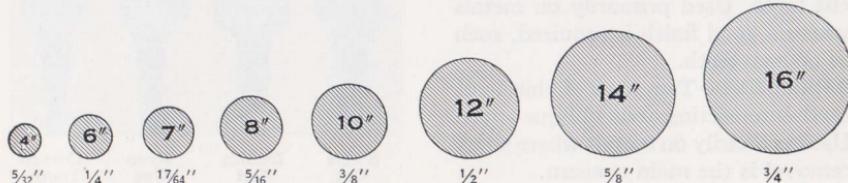
LENGTH—The length of a file is the distance between its point and heel. The tang is not included in this dimension. As a file increases in length, it grows in cross-sectional size. This fact is often important in choosing a file for use on a farm. For instance, a 10" Round file would be too large in diameter to use to enlarge a bolt hole in a small electric motor base, while a 6" Round might work perfectly, because the cross-sectional size is so much smaller. The length of a file is also important in connection with the length of filing stroke that is most

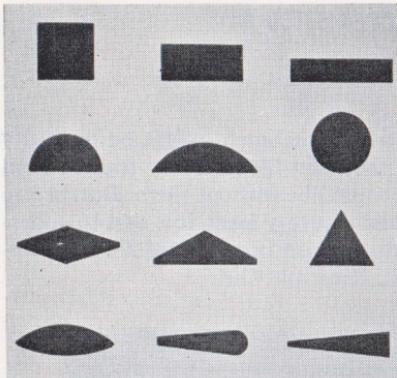
advantageous for a particular application.

KIND—Different types or kinds of files are grouped by their cross-sectional shape, and each specific shape has a name. While the cross sections of some types are obvious, such as Square, Round, and Half Round, the majority are not self-explanatory. The latter include Mill, Taper, Flat, Three Square, etc., and can best be learned by reference to the descriptive material that follows.

The great majority of files diminish in cross-sectional size from the heel

HOW CROSS SECTION INCREASES WITH LENGTH IN ROUND FILES





Typical file cross sections

to the point, and these are known as tapered files. In those cases where the cross-sectional size is maintained throughout the length, the file is termed blunt. Whenever a file is made both ways, it will be tapered

Top—Blunt
Bottom—Tapered

unless otherwise specified. For example, a 10" Square Bastard is tapered and a 10" Square Blunt Bastard has a uniform cross section through its length.

CUT—The cut on a file is determined by the character and coarseness of the teeth. There are four different groupings as to character of the teeth.

SINGLE CUT—A single row of chisel-cut teeth. Used primarily on metals where a good finish is required, such as on saw teeth.

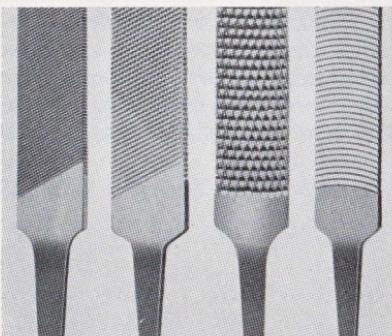
DOUBLE CUT—Two rows of chisel-cut teeth intersecting at an oblique angle. Used primarily on metals where stock removal is the main concern.

RASP CUT—Individually punched teeth which are disconnected from each other. Used on soft materials for rapid stock removal.

CURVED TOOTH—Teeth are milled in an arc. For use on large areas of the softer metals and other materials. For rapid stock removal and a good finish.

Each of the four types of teeth named above is made in three different coarsenesses, namely, Bastard, Second Cut, and Smooth, with the exception of Curved Tooth, which is designated as Standard, Fine, and Smooth. Another way to state it is that almost every file of a given length and kind is made in three coarsenesses. The Bastard cut will give greater stock removal and a rougher finish while the Smooth cut gives a lower stock removal and a smoother finish.

Another factor which is important is the fact that as a file's length increases, the cut becomes coarser. For example, the 4" Mill Bastard file has many more teeth per inch than the 16" Mill Bastard file. This is a logical condition, since a 4" file is used in fine filing operations, while a 16" is used in heavy work.



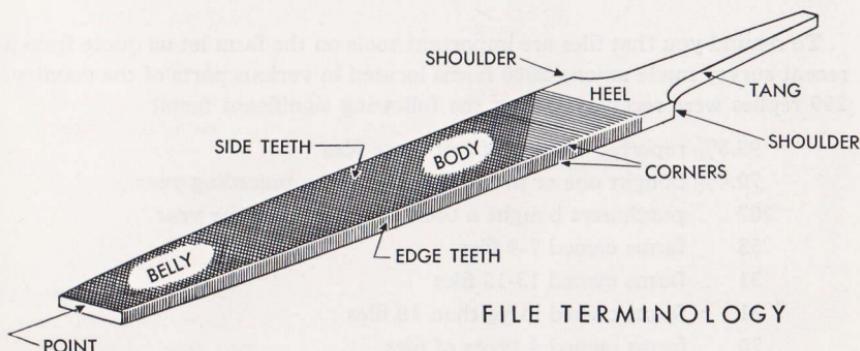
Single Cut

Double Cut

Rasp Cut

Curved Tooth

HOW TO ORDER A FILE



In the illustration directly above are shown the various parts of a file. The file illustrated happens to be a Flat Bastard. In ordering a file, you need not remember all of these parts but it will be extremely helpful to your source of supply if you will specify three items just discussed.—i.e.

LENGTH
10"

KIND
Flat

CUT
Bastard

Thus, in this example you would get a file 10" long (exclusive of tang) with rectangular section and double cut teeth, in the Bastard, or medium degree of coarseness.

WHERE TO BUY FILES

Just as files are universally used by farmers, so Nicholson Files are universally sold by dealers in agricultural areas. You will find the commonly used types and sizes on the counters, wrapped in cellophane, or on the shelves in regular boxes, each file wrapped in heavy paper. May we caution you against buying a file unless it is protected by one of the aforementioned methods. Files displayed without protection tend to accumulate rust marks from handling.

Some individual preferences for types and sizes vary with the locality and you may find that your dealer



will have to order certain files from his wholesaler. Do not hesitate to ask him to do so. He knows he can get prompt service and he will be only too glad to create a thoroughly satisfied customer by meeting your requirements in every respect.

TO REMIND YOU

To remind you that files are important tools on the farm let us quote from a recent survey made among 2000 farms located in various parts of the country. 299 replies were received, giving the following significant facts:

- 98.3% reported owning one or more files
- 70.4% bought one or more files during the preceding year
- 207 purchasers bought a total of 982 files in one year
- 53 farms owned 7-9 files
- 31 farms owned 13-15 files
- 31 farms owned more than 18 files
- 70 farms owned 4 types of files
- 102 farms owned 5 types of files

Files are valuable tools that will save you time and money, and this booklet deals specifically with

FILES FOR THE FARM

The files which are illustrated and described on pages 9 through 18 have been selected as most generally useful for farm applications. The three main classifications are saw files, machinists files, and rasps. Two items outside of these classifications i.e. Auger Bit and Tungsten Point Files, have been added because they, too, are needed on the farm.

The section included within pages 9 through 18 is substantially a catalog of files for farm use. The files have been selected as a result of many calls on farmers and on hardware stores which serve farm areas. As you read this section, you will see that the necessary data for use in ordering is given; i.e. length, kind and cut. You can see from the illustrations the shape of each file and you will find information about the work it will do.

On pages 19 through 28 you will find a collection of photographs showing files in action on the farm. We suggest a study of these since they illustrate many time-saving, practical usages in a wide variety of applications.

Finally, starting on page 29, there is a section in which suggestions are made for using files to the greatest advantage. Special attention has been given to saw filing, including the proper files and techniques to use on hand saws, circular saws and the various types of chain saws.

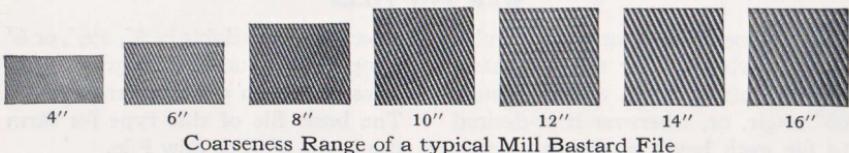
It is our hope that this information will save time and money for you.

SAW FILES FOR THE FARM

MILL FILES

The name is derived from the broad usage given these files for sharpening Mill or Circular saws. Rectangular in shape, they are single cut on sides and edges. Mill files are normally supplied with square edges but may be obtained with one or two round edges if so specified. On the farm the Mill File is a "general purpose" tool. It has a broad range of applications in upkeep

and repair work, in addition to its use as an instrument for saw sharpening. Mill Files may be used for edging tools, machine knives, for lathe work, draw-filing, and many finishing operations. Standard equipment for the work bench on every farm, should include the 8" Mill Bastard and 10" Mill Bastard—One Round Edge.



Mill Bastard File—One Round Edge

TRIANGULAR SAW FILES

These are used in sharpening Hand Saws having teeth of a 60° angle, including both Crosscut and Ripsaw types.

In addition to being made in various lengths, triangular saw files are available in various thicknesses, which are identified from the largest to the smallest, as Regular Taper, Slim Taper, Extra Slim Taper, and Double Extra Slim Taper. Triangular saw files are made in one degree of coarseness, so no cut designation is used. These files are single cut. There

is probably no farm without a variety of Handsaws, and the Triangular Saw File is essential to maintaining these in sharp, serviceable condition.

Triangular Saw File usage extends beyond Handsaw sharpening. These files are used also, in sharpening large Crosscut Saws, combining "cutter" teeth and "rakers", and in certain mechanics' operations unrelated to saw sharpening. Page 34 carries a table showing the files recommended for all coarsenesses of Handsaws normally found on the farm.

Triangular Saw File

PRUNING SAW FILES

Needle Point Pruning Saw sharpening calls for a special file. Pruning Saw Files are made on diamond shaped blanks, 6" long. Single cut on

edges and both faces of one side, other side uncut or *safe*. Made in one cut only. Farm tools should include the 6" Pruning Saw File.



Pruning Saw File

WEB SAW FILES

Developed for sharpening Pulpwood, Web or other types of saws having cutting teeth of less than a 60° angle, or, wherever it is desired to file each bevel of the saw tooth

separately. Available in 5", 5½", or 6" Lengths. Cut on both edges and all sides. Made in one coarseness only. The basic file of this type for farm use is the 5" Web Saw File.



Web Saw File

GREAT AMERICAN CROSSCUT FILES

The cross section of this file has the shape of a knife with a round back. It was designed originally for large crosscut saws with the "Great American" type of tooth pattern. It is now used widely for sharpening most types of one and two-man crosscut saws. The sides are em-

ployed in bringing the teeth to a sharp point and the back to deepen the rounded gullets between sections of the teeth. The files are made in one coarseness with single-cut teeth on sides, back and edge. Suggested for farm use is the 8" Great American Crosscut File.



Great American Crosscut File

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BANDSAW FILES

Narrow band saws have well-rounded gullets between the teeth, and Bandsaw Files have rounded edges that are specially shaped to fit

these gullets. Triangular in section and single cut in one coarseness only. The following table may be used as a guide for selecting Bandsaw Files:

BAND SAWS

	FILE
3 and 4 Point	6" Bandsaw Taper No. 63
5, 6, and 7 Point	6" Bandsaw Taper Slim No. 64



Bandsaw Taper File

CANTSAW FILE

For sharpening large Crosscut Saws with "M" teeth, or for saws with teeth of less than a 60° angle, this file is *the right tool for the job*. It is widely used for filing many types

of Circular Saws: Single Cut. In one coarseness only. Made in four Lengths from 6" to 10". For the farm the 10" is suggested.



Cantsaw File

CHAIN SAW FILES

The *type* of Chain Saws available on the farm, determines the proper file for sharpening. Chain Saw teeth can be generally classified by one of the following three types: (1) Round-

hooded; (2) Square-hooded; (3) Combination "cutter" and "raker" teeth. Select from the four files which follow, those needed for your own equipment. Have them available for use.

ROUND SMOOTH CHAIN SAW FILE

Designed to have a smooth, fast cutting action and a good "bite", the Round Smooth Chain Saw File gives Chain Saw Teeth of the Round

Hooded Type razor-like sharpness—and dresses teeth uniformly for long chain life. Length 8", diameters $\frac{3}{16}$ ", $\frac{1}{4}$ ", $\frac{5}{16}$ ", $\frac{3}{8}$ " or $\frac{9}{32}$ ".



Round Chain Saw File

SQUARE CHAIN SAW FILE

For use on Square-hooded Chain Saw teeth. Permits two cutting edges of this type tooth to be filed simul-

taneously. Made in 6" length with a width of $\frac{1}{32}$ ". Single cut in one coarseness only.

Square Chain Saw File

LOZENGE CHAIN SAW FILE

In general, this file is designed for the same purpose as the Square Chain Saw File. Many filers, however, prefer the Diamond Cross Section to the

Square shape. Files two cutting edges simultaneously. Length 6". Single cut in one coarseness only.

Lozenge Chain Saw File

FLAT CHAIN SAW FILE

For Chain Saws combining "cutter" and "raker" teeth. Two round

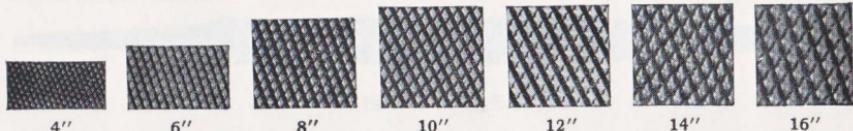
edges. 7" or 8" Lengths—depending on size of tooth. Single Cut.

Flat Chain Saw File

It is well to again remind the reader that the Files just described under the heading "SAW FILES", have broad application in general upkeep and repair work, for the sharpening of cutting tools other than saws, and for many additional trimming, edging, smoothing, fitting and finishing usages.

MACHINISTS FILES FOR THE FARM

Under this classification is included an assortment of files widely used on farm maintenance and upkeep of mechanized equipment. Machinists files are Double cut and are used in those applications where removal of material is the primary aim and the smoothness of finish is secondary. They are available in the following shapes: Flat, Hand, Round, Half Round, Square, Pillar, Three Square, Warding and Knife. The typical coarseness range in one cut for a Machinists file is shown below:



Coarseness Range of a Typical Machinist Flat Bastard File

FLAT FILES

This is a popular type of file for general filing around the farm. The files taper in both width and thickness and are double cut on the sides and single cut on the edges. They

may be used on a wide variety of materials where stock removal is paramount and finish produced is secondary. Recommended for farm use is the 10" length.



Flat Bastard File

Note: Available in the Flat File family is the Hand File for those who prefer it. The Hand File is made from the same size steel as the Flat File, but it does not taper in width. It is made with one edge safe, (uncut)—a desirable feature in work where the filing involves two surfaces at 90° angles to each other, one of which must be filed without injury to the other. The tooth construction and coarseness of Hand Files are the same as that of Flat Files.

SQUARE FILES

As their name indicates, these are square in cross section. They have a broad usage application in farm upkeep and repair for the filing of slots, keyways, and for general surface filing. Many farmers prefer the Square

File to the Flat File because of their heavier section and four equal filing surfaces. Square Files taper slightly toward the point. A good general length for farm use is the 10".



Square Bastard File

THREE SQUARE FILES

Files of this type are triangular in cross section resembling somewhat, Triangular Saw Files, but are Double Cut and have fairly sharp corners. They are used generally for filing in-

ternal angles more acute than the right angle, for clearing out square corners, and repairing damaged threads. Suggested for farm use is the 8" Three Square Bastard File.



Three Square Bastard File

ROUND FILES

Circular in section, these are principally used for enlarging circular openings and on concave surfaces. Round Files taper to the point, which allows the file to be inserted into a

restricted space and to enlarge that opening. Round Files are used in a variety of applications on both metals and wood. Recommended for farm use are the 8" and 10" lengths.



Round Bastard File

HALF ROUND FILES

These are essential tools on every farm. The section, which is rounded on one side and flat on the other, permits use of the file on convex and con-

ave surfaces. Tapered toward the point in width and thickness. Recommended for farm use are the 8" and 10" lengths.



Half Round Bastard File

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HANDY FILE

A useful file for general work. Actually two files in one because it is single cut on one side and double cut on the other. The safety handle brings

convenience in use and the hole in the handle makes it easy to hang the file on a nail.



Handy File

MACHINIST'S G. P. (GENERAL PURPOSE) FILES

These are of exclusive Nicholson design and have Single Cut teeth, divided by angular serrations. They are extremely versatile in both rough filing and finishing of various metals widely used on farm machinery and equipment, such as: aluminum, bronze, cast iron, malleable iron, brass and steel. The special design of the teeth of the G. P. Files readily frees them from chips, and accomplishes both rough and smooth filing opera-

tions simultaneously. They cut faster than Single Cut file types yet leave a smoother finish than the average Double Cut. In addition to general purpose use on a variety of metals, G. P. Files can be used effectively on wood, also. They are made from flat blanks which taper in width but not in thickness, and in one degree of coarseness only. Necessary in every farm's maintenance equipment is the 8" Machinist's G. P. File.



Machinist's G. P. File

The wide variety of usage possibilities of Files for the Farm, is clearly illustrated, when one considers the broad range of functions which files of both the Saw and Machinist types are called upon to perform. A farm is not well equipped with tools, however, unless it has an assortment of rasps.

RASPS FOR THE FARM

On every farm there are numerous applications where only a rasp is *the right tool for the job*. Rasp Cuts are unlike either Single or Double Cut files of the Saw or Machinist variety. Their teeth are individually formed and disconnected. The resulting cut is extremely rough and, in general, finds its most useful applications on wood, leather, hoofs, and soft metals, for the fast removal of material. Rasps have a wide va-

riety of usages in upkeep and repair work. They are used on wheels and for plumbing repairs where the removal of soft metals is involved. Rasps are also selected for horse shoeing, cattle horn filing and for fitting wooden doors, gates and drawers, etc. While Rasps are available in a number of kinds, there are three basic Rasps required to complete the essential assortment of Files for the Farm.

FLAT AND HALF ROUND WOOD RASPS

These are made from special blanks of the same basic shapes as those from which Machinists' Flat and Half Round files are produced. The same relative degree of coarseness in the cut is maintained throughout both sides of Flat and Half Round

Wood Rasps. They are single cut on edges. In general, these Rasps are employed in many woodworking operations and for plumbing maintenance. Important on every farm are the 8" Flat Bastard Wood Rasp and 8" Half Round Bastard Wood Rasp.



Flat Bastard Wood Rasp



Half Round Bastard Wood Rasp

4-IN-HAND RASP

This is a versatile cutting tool that may be used in a multitude of filing operations around the farm. It has two flat and two convex surfaces. One of each has rasp teeth for rapid removal of material, and the remaining

two have file teeth for smoothing. Typical applications include freeing of a sticking door or drawer, fitting an axe or hammer handle, removing burs from the edge of sheet metal or the inside of a pipe.



4-in-Hand Rasp (formerly Shoe Rasp)

HORSE RASPS

Used, as name implies, in horse-shoeing and elsewhere for the quick removal of relatively soft substances. Flat in section. They are available in plain and tanged types. The Plain Horse Rasp, which is double ended, has two sets of teeth on each side, facing in opposite directions from the

center. All Horse Rasps are Rasp Cut on one side and File Cut on the other and have a tooth construction that is considerably coarser than that on Wood Rasps. Both edges are Single Cut. Recommended for farm use is the 14" Plain Horse Rasp or 14" Tanged Horse Rasp.



Plain Horse Rasp



Tanged Horse Rasp



SPECIAL PURPOSE FILES

Nicholson

AUGER BIT FILES

Used to sharpen the lips and the spurs of Auger Bits. The files are double ended. The teeth are cut on the side on one end, and the edges on the other end. This design allows any

surface of the lips or spurs to be filed without damaging an adjacent surface. The Auger Bit File is made in the 7" length only and this will fit all auger bits that are used on the farm.



Auger Bit File

TUNGSTEN FILES

This is an essential file on every farm in which an automobile, truck, tractor, or other mechanized farming equipment utilizing a make-and-break electrical system, is employed.

They are used primarily for dressing distributor points, but can also be used to clean any electrical contact points.



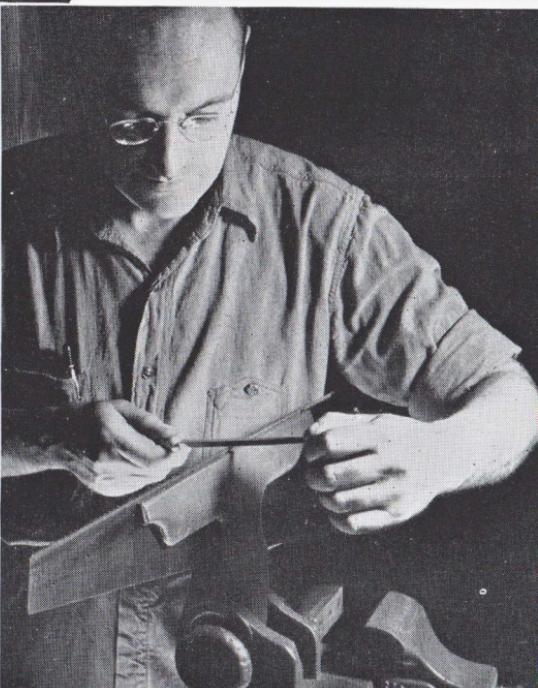
Tungsten Point File

There are literally hundreds of occasions where these files will serve you profitably. By doing each job better, quicker, more efficiently, they help to *conserve your time*, keep your farm, equipment and implements in peak condition. This frees you for the important task of farm operation. Illustrated on pages 19-28 are many useful applications.



SHARP SAWS SAVE TIME— MAKE TOUGH-GOING EASY

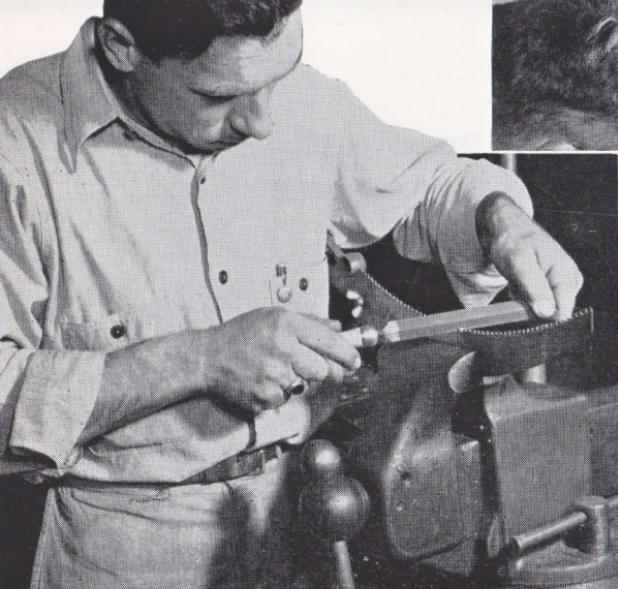
Sharpening large Circular Cross-cut Saw with Mill Bastard one round edge file. Each side of the tooth is filed to bring it to a sharp cutting point. Rounded edge of the file prevents nicking at base of the saw tooth where it meets the gullet.



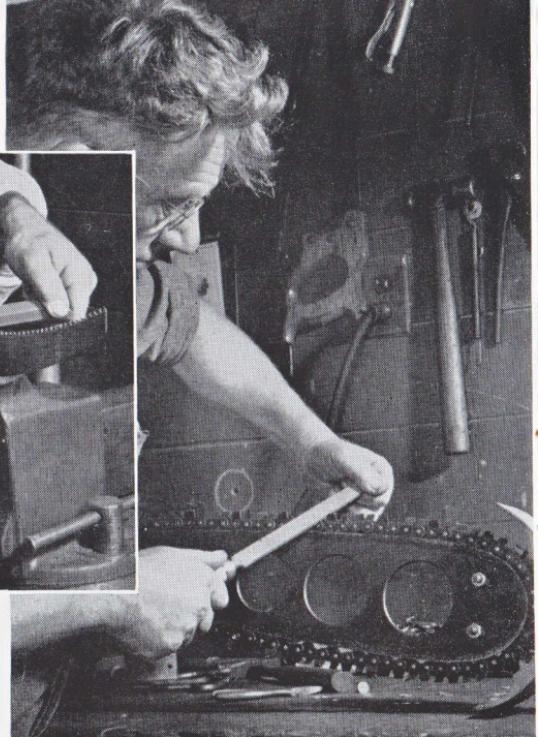
Certainly no farm is without a Hand Crosscut Saw. A sharp saw is smart business. The Triangular Saw File performs this work. (See "Sharpening the Hand Crosscut Saw", page 34)



Through the year saw filing is a common job on every farm. Note the comfortable elbow-height position at which this Triangular Saw File is being used.



In the family of farm implements, the pruning saw is a useful member. Illustrated here is correct Pruning Saw File technique in which the 6" Pruning Saw File does the job.



Chain saw teeth vary in type. Each type requires a special file for sharpening. (See "Sharpening Chain Saws", page 41)



Sharpening the bucksaw with the blade still in frame although held in vise. The Slim Taper does the job. (See "Sharpening Bucksaws", page 39)



Sharpening the large Crosscut Saw with the Great American Crosscut File. Rounded back is being used to deepen gullets of Crosscut Saw teeth; sides are used for filing teeth themselves. (See page 36).



Sharpening raker teeth of combination circular saw with Cantsaw File.

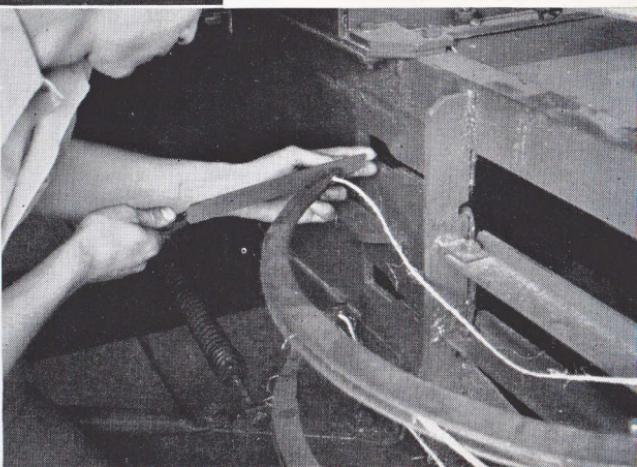
THE MILL FILE IS USED
ALL OVER THE FARM

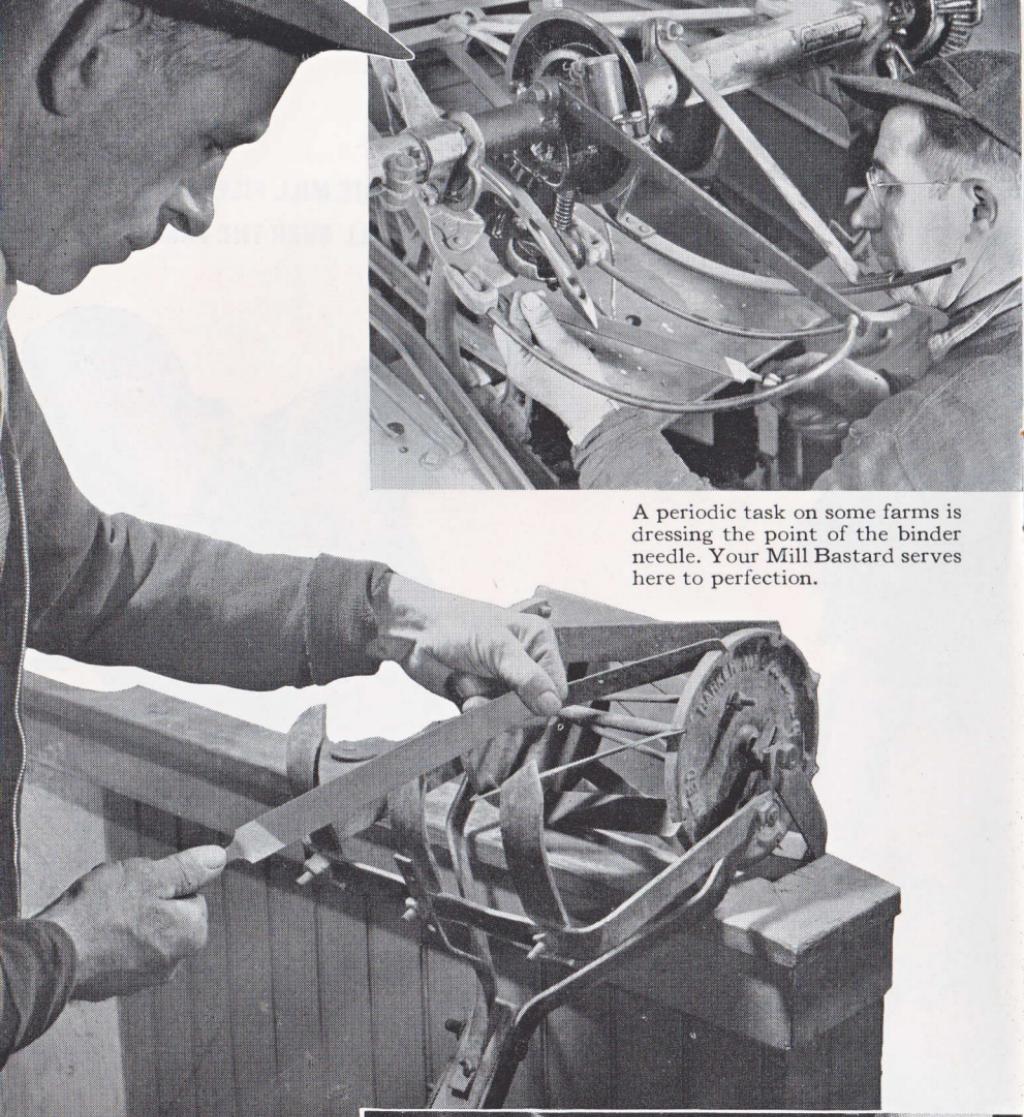


Dressing a hoe with a 12" Mill Bastard File—hand cultivating goes faster when a sharp hoe edge cuts the soil.

Sharpening ledger plate
on sickle bar, using 12"
Mill Bastard.

Dressing baler needle
with 10" Mill Bastard.
Well cared for equipment
works better—
lasts longer.





A periodic task on some farms is dressing the point of the binder needle. Your Mill Bastard serves here to perfection.

Sharpening weeding hooks on hand-wheeled weeder mulcher. The 10" Mill Bastard File makes short work of this chore.

Smoothing broken cattle horns is a common use for your 4-in-Hand. This file is also useful for dressing down horns of show and sale cattle.



EVERY FARM HAS DOZENS
OF USES FOR NICHOLSON
MILL FILES



Pointing-up binder knife guards is another bit of work that must be taken in stride. Again the Mill Bastard re-appears on the up-keep-and-repair scene.



Removing rough edges from key slot on combine cylinder shaft preliminary to replacing bearing. Here the Mill File demonstrates one of its many "general-purpose" usages.

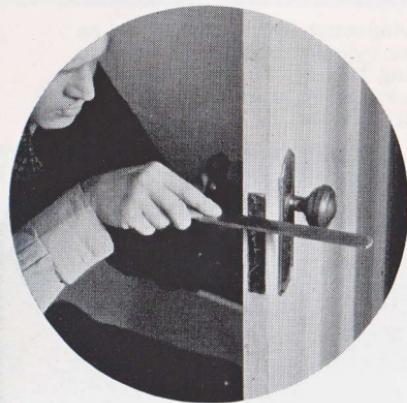


Periodic chore of the Mill Bastard is conditioning the points of the hay fork.

Resharpening silage cutter blades with Mill Bastard File.



Filing rolling coulter on 16" two-bottom tractor plow using 10" Flat Bastard.



Trimming down the latch on a door for proper fit using a Handy File.



FILING IS THE EASIEST WAY TO TRIM AND ADJUST FIT



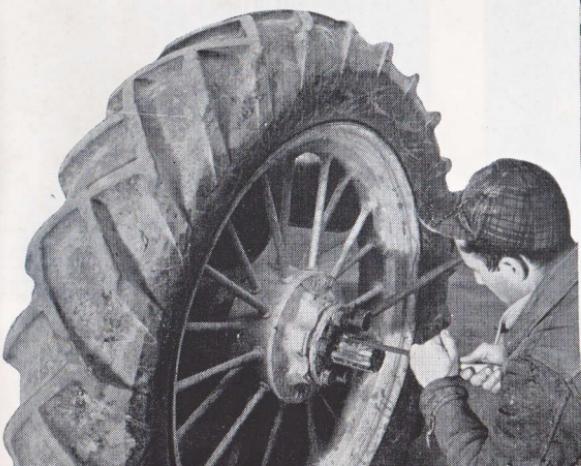
The Farm Schools are careful to use *the right file for the job*. In this picture a stanchion repair job is undertaken with the 10" Machinist's Round File—Bastard Cut, doing the *right job*.



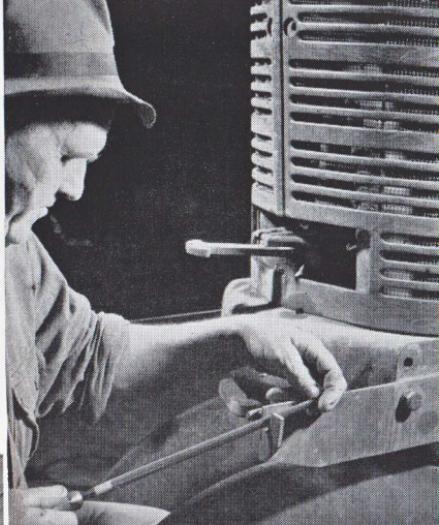
Rounding off head corners of stud bolt on calf stall—10" Flat Bastard File.

Filing down key on sprocket spindle of hay loader. The 10" Flat Bastard File handled this task in "jig time".

GENERAL REPAIR WORK WITH NICHOLSON FILES



In this picture, the splines on the axle are being dressed with a Machinist's Square File.



Shaping hanging groove in tractor lamp bracket with a Round Bastard File.



Conditioning pedal notches on the farm tractor with a Machinist's Flat File, Bastard Cut.

Removing round edges and bruises from posthole digger in barnyard. 10" Half Round Bastard does the trick.



Hand tools do their work better, faster and easier when kept in good condition. Here, a trowel is being readied to resume its normal functions. A 10" Mill Bastard File makes the chore a "snap".



Rounding bottoms of slots in land-side furrow lever lock on tractor plow using an 8" Round Bastard.

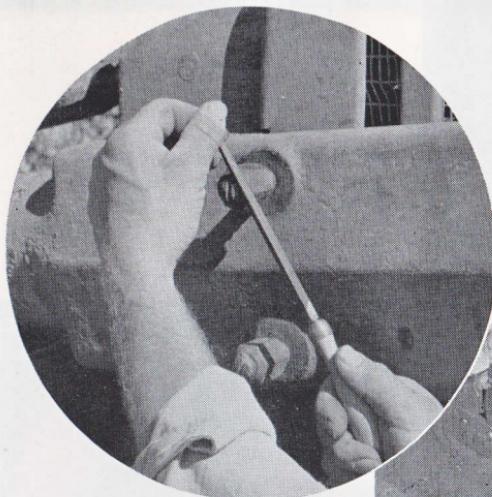


The 12" Flat Bastard File makes short work of the smoothing of the hub of this cast iron sprocket.

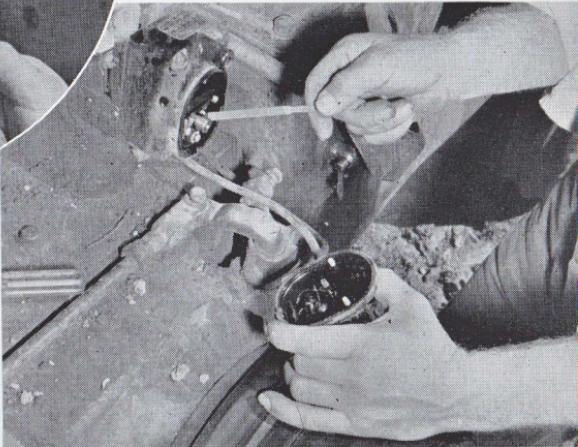


Removing bur and touching up keyway in a key fitting operation with a 12" Square Smooth File.

**NICHOLSON FILES—
JOB DESIGNED TO
MAKE MAINTENANCE
EASIER**



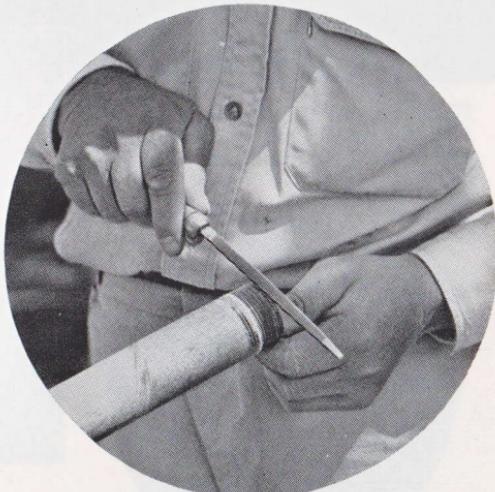
Chasing threads on a tractor stud bolt. A 6" Extra Slim Taper or 6" Three Square Bastard may be used to repair damaged threads or to clean up rusted threads so the nut can be properly removed and then replaced.



Cleaning tractor distributor points. The Tungsten Point File is used because it is designed for equipment employing make-and-break electrical circuits.



With the "passing of the village smithy", horseshoeing is done on some farms. Shown is the final dressing of the hoof and shoe—the Horse Rasp is, of course, *the right tool*.



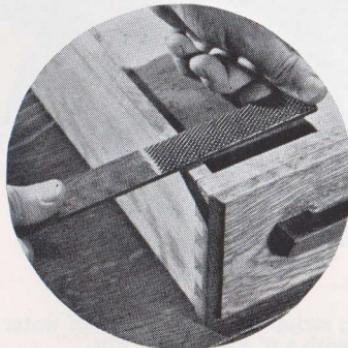
Filing stripped thread on end of water pipe with a 6" Slim Taper File.



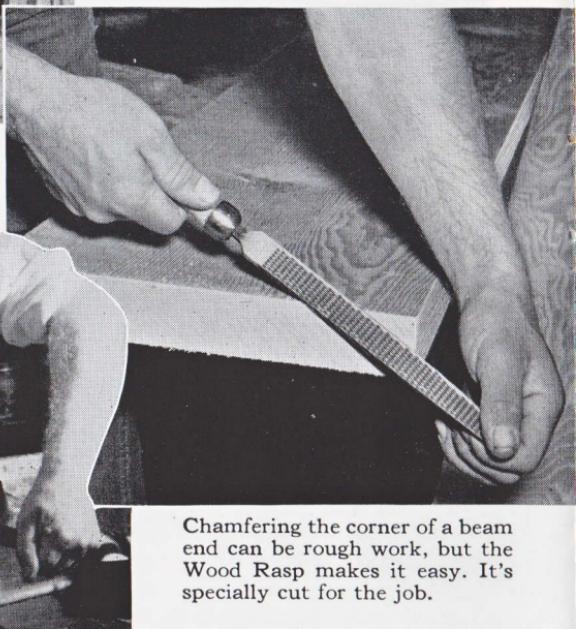
Re-shaping worn teeth of lever rack on a hay tedder using a 10" Square Bastard File.



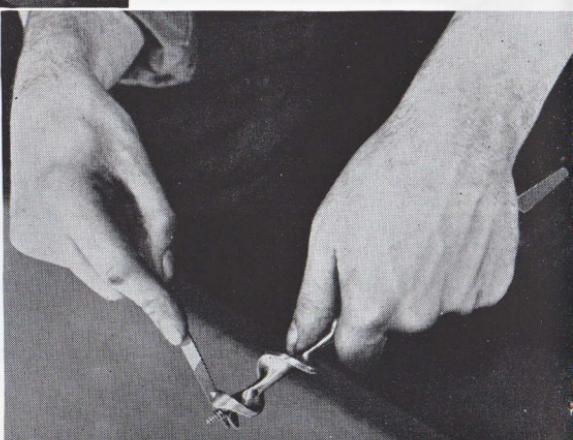
Sharpening the farm axe when held in a vise leaves both hands free to use the Mill Bastard.



The file cut surface of a 4-in-Hand Rasp is used to remove excess wood from a sticking drawer.



Chamfering the corner of a beam end can be rough work, but the Wood Rasp makes it easy. It's specially cut for the job.



Sharpening the spur of an auger bit with the 7" Auger Bit File.

FILES FOR THE FARM . . .

How to use them

THE RIGHT TOOL FOR THE JOB

Is only as efficient as the hand and the head that guide it. Nowhere is this better illustrated than in the proper use of files. The correct method of holding a file—the way it is stroked and the pressure applied, vary widely with the type of work. In addition, there are three primary filing actions which should be understood since they illustrate the basic applications of the file to its job. But, before attempting to use any file, be sure that it is equipped with a suitable handle of the proper size to fit tightly on the tang while covering three-quarters to seven-eighths of its length only.

STRAIGHT FILING

The files which we have discussed are designed to cut on the forward stroke. Hence, in *Straight Filing*, the file is pushed lengthwise or at a slight diagonal across the work. The pressure should be applied on the forward stroke, the file being lifted clear of the work on the return stroke unless a very soft material is being filed which causes clogging or pinning, in which case the file may be dragged on

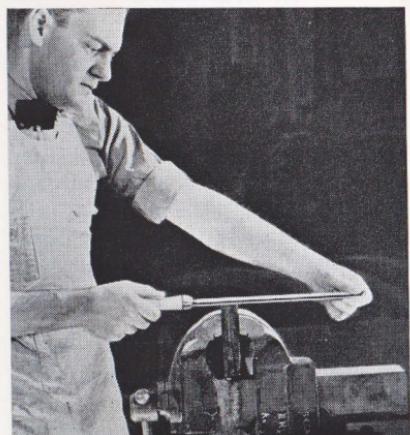


Fig. 1—Straight Filing

the back stroke under the pressure of its own weight only. (See Fig. 1).



Fig. 2—Draw Filing

DRAW FILING

This is a method of using the file to produce a good finished surface. A file is grasped with both hands, the thumbs being a half to three-quarters of an inch from the work. The desired finish is then obtained by drawing and pushing the file over the work surface. Single Cut files used in this fashion, have a shearing action that produces a smooth finish (See Fig. 2).

LATHE FILING

This filing action consists of stroking the file against the work revolving in a lathe. Extreme caution must be exercised to keep the arms and clothing away from dog and other revolving portions of the lathe work. The file should never be held in a rigid or stationary position. In work of this type, a slight lateral or gliding motion avoids ridges or scoring, and assists the file in clearing itself of chips. (See Fig. 3).

These, then, are the three elementary filing actions. Other factors, however, contribute to the expert use of the file.

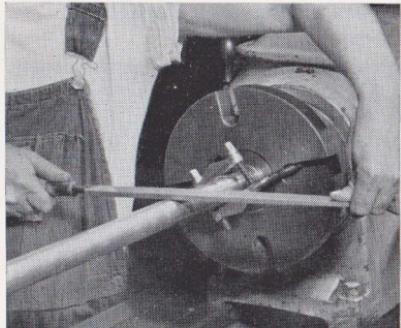


Fig. 3—Lathe Filing

HOLDING THE WORK

In most filing operations the work is held in a vise. Care should be taken to protect the work so held, against damage resulting from the pressure applied by the vise. Pieces of soft metal, such as zinc or copper, can be used in this connection. They are placed between the jaws of the vise and the work itself. (See Fig. 4).

Round pieces, such as small rods or pins, can be held in a block of hard, close grained wood grooved in various sizes to suit this purpose.



Fig. 4—Holding the work

THE HEIGHT OF THE WORK

The height at which the filing operation is done is important. For general filing elbow height is satisfactory, but for heavy filing the work should be lower. Filing of a fine or precision nature is more suitably done at approximately eye level.

GENERAL POINTS TO REMEMBER

In filing operations where both hands are to be used, the handle of the file should be grasped so that the end will fit into and up against the fleshy part of the palm with the thumb lying along the top of the handle. (See Fig. 1). The fingers are curved to encircle the handle from the underside in such a way that the fingertips point upward to the operator's face.

The point of the file should be held between the thumb and first two fingers. (See Fig. 3). The thumb is on top and is used to apply the pressure on the forward stroke. The fingers are underneath and lift the file on the re-

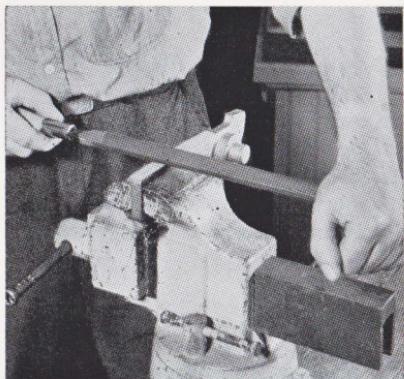


Fig. 5—Correct technique for rapid stock removal

turn stroke. If heavy pressure is needed in a filing operation, the hand should be placed on the point end of the file so that the point rests in the palm and the fingers are curved under the point. Considerable downward pressure may be exerted in this manner by the heel of the hand without tiring the thumb. (See Fig. 5).

In filing operations where the file is held in one hand only, such as in filing pins, dies and edge tools not held in a vise, the forefinger, not the thumb, is extended over the length of the handle to rest on the file itself. Using the forefinger in this way permits the application of the necessary amount of downward pressure required for the operation. (See Fig. 6).

The inexperienced filer should exercise great care to overcome the natural tendency toward a rocking motion resulting from the incorrect use of his hands and arms. This will produce a convex surface where a flat or level one is desired. In order to file a flat surface, carry the file forward in a straight line. Changing the lateral direction of stroke slightly helps to

produce a flat surface because it will show up unevenness in the finish and corrective filing strokes may then be taken.

The nature of the work itself should be kept constantly in mind. It determines, to a large extent, the degree of pressure which should be correctly exerted. The important essential is to *keep the file cutting*. Too little pressure will permit it to *slide* over the harder metals and dull the file teeth. Too much pressure quickly overloads the teeth, thus chipping or clogging them.

To the foregoing considerations must be added such basic matters as, the shape of the work; size and character of the surface (edge, notch, slot or hole); the amount of material to

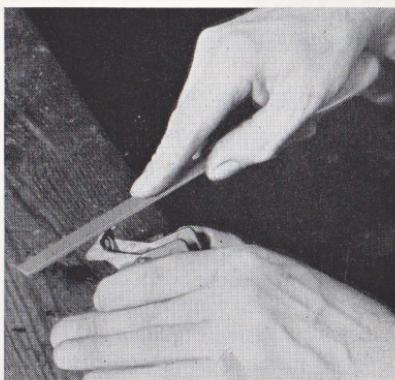


Fig. 6—One hand filing

be removed; the degree of smoothness or finish required. Then, finally, the practical amount of time which should be expended in the accomplishment of the task. The importance of *the right file for the job* is quickly apparent when evaluated against such points.

FARM SAWS . . .

how to file them

Among the tools and implements found on every farm is, of course, a variety of saws. Maintaining these in sharp, serviceable condition, constitutes a broad filing field in itself. It is the purpose of this section to point out the proper method for filing each of the principal types of saws customarily found on the farm. Before doing so, however, it is best to be completely familiar with saw filing terminology as used in this chapter.

SAW FILING TERMINOLOGY

SET, SETTING OR RESET

This refers to the sidewise deflection of the tops of alternate saw teeth in opposite directions in order to give saw blade clearance as it passes through the cut. Resetting is accomplished with a tool designed for the purpose, the Sawset. Generally speaking, the saw may be filed four or five times before resetting is required.

JOINT OR JOINTING

The preliminary filing operation before sharpening, performed to assure the tops of all teeth being of equal height. In jointing hand saws, the file is passed lightly lengthwise along the tops of the teeth until every tooth has been touched. The small flat that is formed on the tops of the teeth provides a guide for the subsequent sharpening.

CUTTER OR CUTTING TEETH

The teeth of a saw which actually do the cutting, as opposed to those called "rakers". Cutter teeth are slightly higher than rakers.

RAKERS OR RAKER TEETH

The teeth of a saw which serve to clean out the cut but perform no cutting action. Raker teeth are filed so that the tops are slightly below the level of cutting teeth.



Fig. 7—Jointing a Handsaw

GULLET

The area between the back of one saw tooth and the face of the next at the base of the teeth.

GENERAL SAW FILING ADVICE

In all saw filing, it is considered to be proper to lift the file from the work on the back stroke. This prevents premature wear of the file teeth due to rubbing on a non-cutting stroke and eliminates face tooth breakage.

The proper order of saw filing operations is: (1) **JOINT THE TEETH**. This refers to the process of making all the saw teeth the same height. On hand and similar saws, lay a Mill File lengthwise on the saw teeth and pass it lightly back and forth (without lifting) over the full length of the

blade until the file touches the top of every tooth. (See Fig. 7). Be sure that the file is held flat and does not tip to one side or the other. Jointing of circular saws is described on page 37.

(2) **SET THE TEETH**—Set the teeth only when necessary. Normally every fourth resharpening is sufficient. Only the top half of the teeth should be set because the teeth may break out if a greater amount is used. The degree of set to the side depends on the condition of the saw and the type of wood to be cut. If the saw is straight, the set can be small. Soft, wet woods are normally cut with a coarse tooth saw that has a generous set, while hard, dry woods can be sawed with fine teeth and little set. An average set amounts to one-quarter of the thickness of the blade to each side. It is important that the set be even on each side and for the full length of the blade. If it is not, the saw will not cut straight. (3) **FILE THE TEETH**—This may then be commenced following the instructions for each type of saw as outlined herewith.

SETTING—Saw setting on the farm is usually accomplished in one of two ways. The most common method of saw setting is by using a special tool known as a sawset (see Fig. 8). The

teeth on Handsaws, Narrow Bandsaws, small Circular Saws, Bucksaws, Pulpwood Saws, and Pruning Saws can all be set with the sawset. In use this tool bends the top of one saw tooth at a time when two handles, similar to those on a pair of pliers, are squeezed together. In setting a Hand Crosscut or Rip Saw with a sawset, the saw should be mounted in a vise with the teeth about three or four inches above the vise jaws. Starting at one end of the saw, place the sawset over the first tooth that is set away from the operator. Squeezing the handles together causes a plunger to press the top of the saw tooth against a beveled anvil. Only the top half of the tooth should be set. Examination of the first tooth that is set will show what adjustment to the plunger and anvil are necessary to obtain the proper amount of set. After this has been determined, every other tooth is set for the length of the saw. The saw is then turned around, and the process is repeated on the alternate teeth, which will again be set away from the operator.

The second method of setting commonly used on the farm is by striking the teeth with a hammer. This method is employed on large Circular Saws and large Crosscut Saws where the teeth are big and the saw steel is thick so that it is difficult to bend the tooth tops with a sawset. Saw manufacturers make a hammer for this type of setting but any hammer that has a small enough face on the head may be used. For setting Circular Saws by this method, the saw manufacturer can supply a setting-stake (see Fig. 9). The setting-stake has a vertical pin, tapered sleeve, and support which hold the Circular Saw in a horizontal plane by the center hole. The pin, sleeve, and support are adjustable in a lateral direction so that a saw of any diameter may be moved



Fig. 8—Sawset

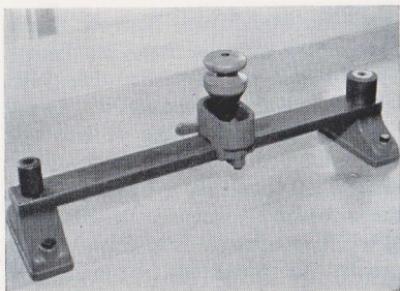


Fig. 9—Setting Stake

to line the teeth up with a circular anvil at either end. The anvil is flat on the top and beveled near the edge. The saw is adjusted so that approximately one-quarter of the tooth extends over the bevel of the anvil. The top of the tooth is then struck with the hammer which bends it out from the side of the blade. The amount of set may be controlled by the distance the tooth is allowed to extend over the bevel of the anvil. The operation is repeated on every other tooth, and then the saw is turned over on the pin and the remaining teeth are set to the other side. Although the setting-stake insures a uniform amount of set, the farmer can improvise by using an anvil or vise with a bevel filed in an appropriate spot. A homemade anvil of this type can also be used for large crosscut and other saws which the sawset cannot handle.

SHARPENING THE HAND CROSSCUT SAW

The first step is to select the right file. The chart at the right illustrates which of the files described earlier in this book, should be used for this purpose.

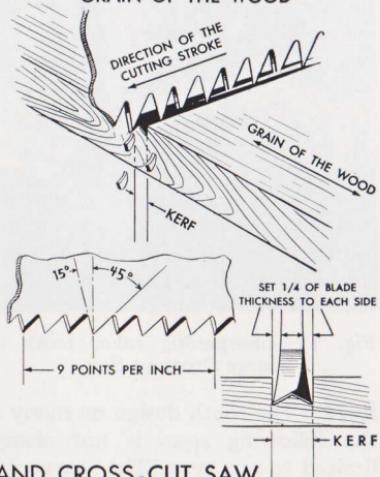
Hand Crosscut saws do their cutting with both the edges and points of the teeth. (See Fig. 10). Hence, both must be accurately beveled and equally sharp. Having selected the

right file, the saw is then clamped *with the handle to the right*, in a saw vise, (See Fig. 11). Where no saw vise is on hand, a satisfactory clamp may be made of wood. The top of the clamp or vise should be about elbow height. The bottom of the saw teeth gullets should be no more than an eighth of an inch above the vise. This prevents improper support of the saw teeth, which results in broken file teeth and short file life. Next, the saw should be jointed to assure all its teeth being of even height and set, if necessary, to provide proper blade clearance in the wood.

The saw is now ready for sharpening. Starting at the point of the saw, the file is placed in the gullet to the left of the first tooth set away from the filer. If the saw has previously been sharpened properly, the file will be level and at an angle to the right of approximately sixty de-

NUMBER OF SAW POINTS PER INCH	RECOMMENDED FILE TO USE
5	7" REGULAR TAPER
6	7" OR 8" SLIM TAPER
7	6" OR 7" SLIM TAPER
8	6" SLIM TAPER OR 7" EXTRA SLIM TAPER OR 8" DOUBLE EXTRA SLIM TAPER
9	6" EXTRA SLIM TAPER OR 7" DOUBLE EXTRA SLIM TAPER
10	5" OR 6" EXTRA SLIM TAPER
11	5" EXTRA SLIM TAPER OR 6" DOUBLE EXTRA SLIM TAPER
12	4½" OR 5" EXTRA SLIM TAPER
13	4½" EXTRA SLIM TAPER OR 5" DOUBLE EXTRA SLIM TAPER
14	4" DOUBLE EXTRA SLIM TAPER
15	4" DOUBLE EXTRA SLIM TAPER
16	4" DOUBLE EXTRA SLIM TAPER

HAND CROSS-CUT SAW CUTTING ACROSS THE GRAIN OF THE WOOD



HAND CROSS-CUT SAW

Fig. 10

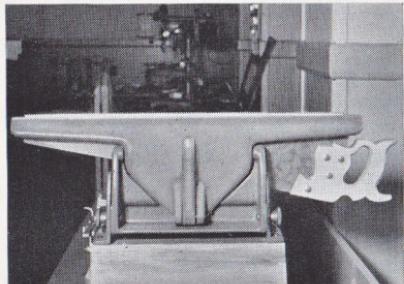


Fig. 11—Handsaw Vise

grees with the saw blade, (See Fig. 12). It also will be turned about its axis so that one side will form an angle of fifteen degrees with the vertical, which will maintain the saw tooth face angle at fifteen degrees. (See Fig. 10). The file is then stroked through the saw until one-half of the flats formed by jointing on the tops of the two adjoining teeth are removed. If the flat on one side is larger than the other, the file must be crowded in that direction. Similar filing should then continue in every

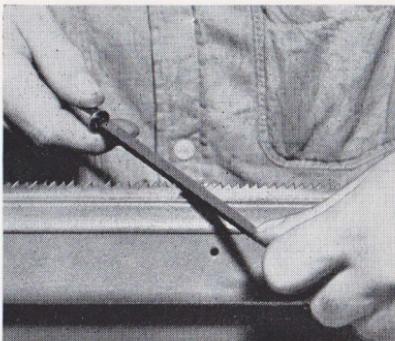


Fig. 12—Sharpening Hand Crosscut Saw

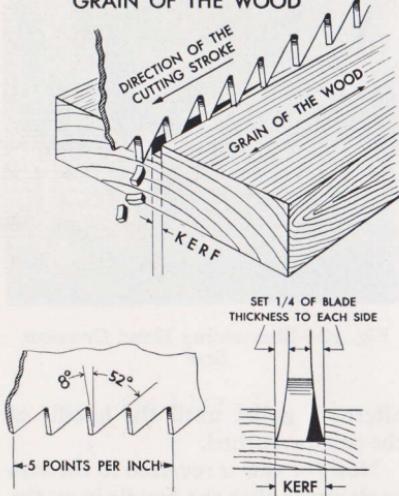
alternate gullet until the handle of the saw is reached.

Now the saw is reversed in the vise or clamp so that the handle is on the left. Starting at the handle end of the saw, place the file in the gullet to the right of the first tooth set away from you. The gullet will not have been filed in the previous operation. The file should now be level and at an angle to the left of approximately sixty degrees with the saw blade. Each alternate gullet is then filed until the flats that were left in the first operation are completely removed. This will leave a sharp cutting point and edge on each tooth.

SHARPENING THE HAND RIPSAW

First, secure the proper file using the chart on the opposite page under Hand Crosscut Saws, as your guide. Setting and jointing of teeth follow the previously outlined pattern, as do also the instructions concerning the use of the saw vise or clamp. The tops of the Ripsaw teeth cut like a series of chisels rather than with a series of points as found on the Crosscut. (See Fig. 13). In sharpening, the file is again held level but at a 90° angle to the saw blade. (See Fig. 14). The file is rotated about its axis so as to pro-

HAND RIP SAW
CUTTING WITH THE
GRAIN OF THE WOOD



HAND RIP SAW

Fig. 13

duce an angle of approximately eight degrees between a vertical line and the tooth face (See Fig. 13). The description regarding the sequence of filing the teeth under the Hand Crosscut (see page 34) should be followed for the Hand Ripsaw. It is bad practice to file all of the teeth from the same side, as this can easily result in the saw running to one side in the cut.

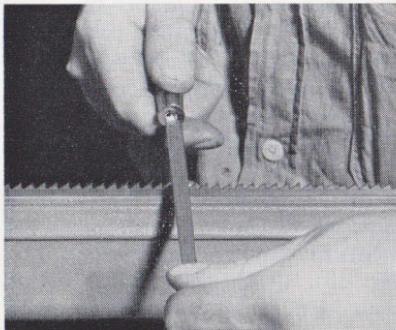


Fig. 14—Sharpening Hand Ripsaw

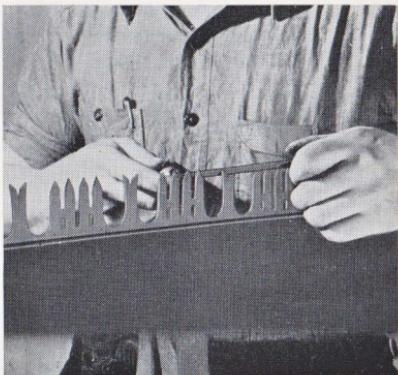


Fig. 15—Sharpening raker tooth on large Crosscut Saw

NOTE—The tooth design on many of the following saws is not always limited to one type. The sharpening technique described is therefore for that style of tooth which is most common in each case.

**SHARPENING THE LARGE
CROSSCUT SAW**

These saws are designed to cut in both directions. The saw tooth construction usually has both cutting teeth and raker teeth (See Fig. 15). The cutting teeth sever the fibers of the wood, and the raker teeth chisel out the wood between the two cuts made by the cutting teeth. For sharpening, the Crosscut Saw should be placed in a vise and jointed in the same way described for the Hand Saw. The Jointing File should be stroked back and forth until every cutting tooth has a small flat on the top. Normally the raker teeth will not be touched in this operation. The raker teeth must then be lowered so that the tops are approximately $\frac{1}{64}$ of an inch below the tops of the cutting teeth. The saw manufacturer can supply a gauge to measure this dimension. In each set of four cutting teeth two are set to one side and the remaining two to the opposite side. This may be accomplished with a

hammer on an anvil as described on page 33 under **SETTING**. Normally $\frac{1}{64}$ of an inch set to each side is sufficient.

Each side of the top of the raker tooth is filed separately with a Mill File (See Fig. 15). Sharpening the cutting teeth can best be accomplished by tilting the vise away from

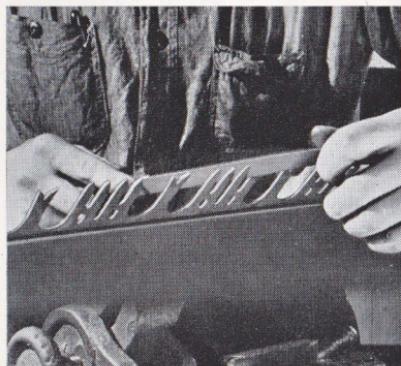


Fig. 16—Sharpening cutting tooth on large Crosscut Saw

the filer at an angle of approximately 45° (See Fig. 16). Many saw sharpening vises provide this feature. Each side of each cutting tooth is then filed individually with a Mill File until the flat formed by jointing is removed and the top of the tooth is a sharp point.

On the usual large crosscut saws there are four cutting teeth in each section. Two teeth from every section are filed from one side of the saw, and then the saw is reversed in the vise so that the remaining teeth may be sharpened. On some crosscut saws, the gullets between the teeth will require deepening after the saw has been resharpened a number of times. The Mill File with round edges is very efficient for this work (See Fig. 17). A small Round File may also be used if the Mill File with round edges is not available.

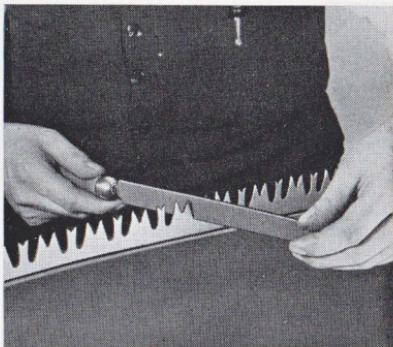


Fig. 17—Deepening gullet on Crosscut Saw

SHARPENING CIRCULAR SAWS

The operations are as follows: 1. **JOINTING**—On the circular table saw, jointing may be accomplished without removing the saw blade from the arbor. The saw blade is adjusted in the machine so that the top is just below the surface of the table. Lay a Mill Smooth File flat on the table over the saw blade and parallel to it with the point of the file to the front. The file should be held in this position with a weight. Make certain that the saw will not start accidentally, preferably by disconnecting the electrical connections to the motor or the belt to the saw arbor. Now turn the saw backwards by hand and slowly raise it until the tops of the saw teeth contact the file. This process is continued until all of the saw teeth are touched, which insures that they all are the same height.

2. **SETTING**—Circular saws may be set in a number of ways. All sizes may be set on the setting-stake (See **SETTING**, Page 33). Circular Saws ten inches and smaller in diameter may also be set by the hand sawset (See Fig. 8). The amount of set used varies between ten and twenty thousandths of an inch to each side, the amount depending on the wood to be cut. Saw

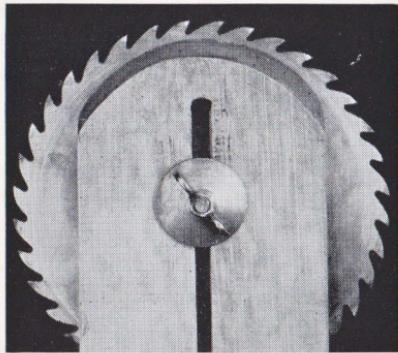


Fig. 18—Wooden vise for circular saw

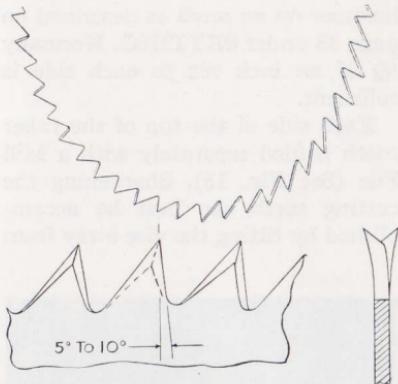
manufacturers also produce hollow ground saws which taper in thickness from the tops of the teeth to the center of the saw so that they should not be set. They are normally used for finish cutting of dry wood where the clearance needed is small.

3. FILING—The larger circular saws may be filed when mounted on their arbors in the machine, provided they do not chatter. If they do, they should be placed in a clamp, then filed (See Fig. 18). Small circular saws are usually filed in a similar circular clamp.

While saw manufacturers make circular saws with a wide variety of tooth patterns, there are three types which are the most widely used:

CIRCULAR CROSSCUT OR CUT OFF SAWs

The teeth on these saws are shaped like a Hand Crosscut Saw tooth, and both the points and edges do the cutting. (See Fig. 19). Most of these saws may be sharpened with a Slim Taper File, since the angle between face of one tooth and the back of the next is sixty degrees. This is particularly true on saws 10" and smaller in diameter. These saws are sharpened just like the hand crosscut saw, except it is best to vary the stroke



CIRCULAR CROSS-CUT SAW

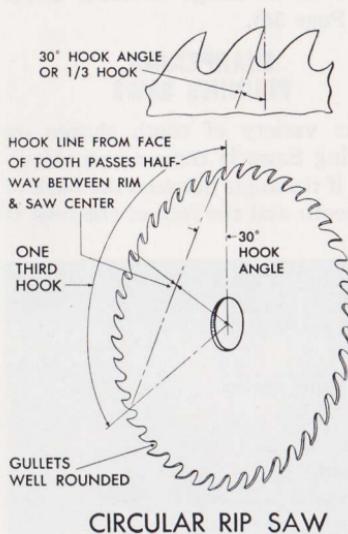
Fig. 19

slightly to maintain the saw manufacturer's original bevel and angle of tooth. On some of the larger Crosscut Saws, the included angle between teeth is less than sixty degrees, and a Mill file with two round edges is recommended. The file is stroked against the face and back of the tooth in separate operations until the flat from jointing is removed. This insures that all the teeth on the sharpened saw will be the same height. The teeth are always filed off the point and with the set. As a result, one-half of the teeth are filed and then the saw is reversed in the vise.

CIRCULAR RIP SAWs

Similar to the Hand Ripsaw, the Circular Ripsaw teeth should come to a sharp horizontal edge rather than to a point (See Fig. 20). Since a Ripsaw is designed to cut with the grain, the teeth chisel their way through the wood and should therefore be filed straight across to a square chisel-like edge. A Mill Bastard with two round edges is the file to use. In the normal sharpening only the back of the saw tooth is filed until the flat from jointing is removed. It is important to retain the same clearance angle. If it is

necessary to deepen the gullets, the hook or face angle of the tooth must be maintained. The correct hook is present when a line along the face of the tooth, if extended, passes approximately halfway between the center and the back of the saw (bisects the radius). (See Fig. 20).

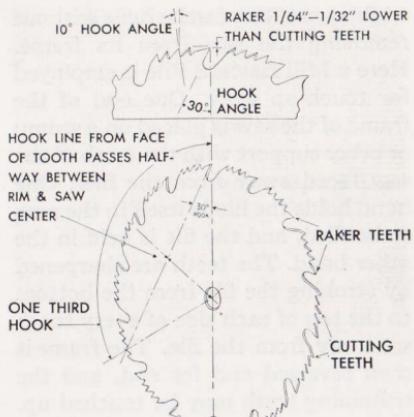


CIRCULAR RIP SAW

Fig. 20

CIRCULAR COMBINATION SAW

These saws are designed to both crosscut and rip. One of the most common types has the teeth arranged in sections. Each section has a raker and four cutting teeth. (See Fig. 21). The cutting teeth have points and edges that cut similar to the Hand Crosscut teeth (see above). They are set alternately to each side. The raker is straight across like the Rip-saw tooth and is slightly lower. It is not set and merely clears the core between the slits taken by the cutting teeth. The cutting teeth are sharpened with a slim taper file just like Hand Crosscut saw teeth. The rakers can be sharpened with the same file



CIRCULAR COMBINATION SAW

Fig. 21

and are filed only on the back and straight across. The raker should be $\frac{1}{64}$ of an inch shorter than the cutting teeth on hard woods and $\frac{1}{32}$ of an inch on soft woods. If it is necessary to deepen the gullets between sections, a Mill File with round edges may be used.

SHARPENING BUCKSAWS

These saws are also known as Wood Saws. They are commonly used to buck cord wood, which gives them the name Bucksaws. (See Fig. 22). If the Bucksaw must be sharpened

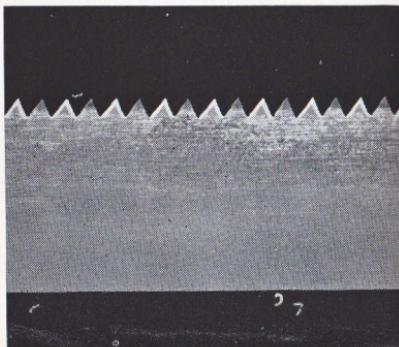


Fig. 22—Bucksaw Teeth

while in use, this can be done without removing the saw from its frame. Here a Mill Bastard File is employed for touch-up work. One end of the frame of the saw is placed on a stump or other support with the teeth of the saw faced away from the filer. One hand holds the blade itself in the area to be filed, and the file is held in the other hand. The teeth are sharpened by stroking the file from the bottom to the top of each side of every tooth set away from the file. The frame is then reversed end for end, and the remaining teeth may be touched up. Each tooth is filed only until the top is returned to a sharp point.

Where the Bucksaw is filed at the work bench, the saw is removed from its frame and placed in a clamp or saw vise, and a Slim Taper File is used for sharpening. The sharpening procedure conforms to the instructions for Hand Crosscut Saws, including jointing and setting. (See Page 34).

SHARPENING PULPWOOD SAWS

These saws are used for felling small trees, limbing, and bucking around the farm (See Fig. 23). The saw blades are relatively thin and narrow. The most common tooth

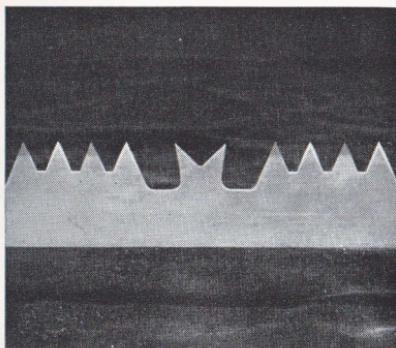


Fig. 23—Pulpwood Saw teeth

style has groups of four cutting teeth and one raker. These saws are sharpened with a Web Saw File (See Page 10). Both sides of each cutting tooth are filed so as to produce a sharp tooth, and the raker is filed slightly lower than the cutters. The methods employed should be similar to that described for Large Crosscut Saws. (See Page 36).

SHARPENING PRUNING SAWS

The variety of tooth shapes on Pruning Saws is tremendous. However, if the angle between the back of one tooth and the face of the next is

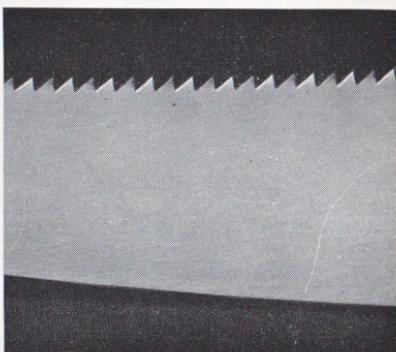


Fig. 24—60° included angle Pruning Saw Teeth

sixty degrees, (See Fig. 24) the Extra Slim Taper file may be used in a manner similar to that described for the hand crosscut file. (See Page 34). If the angle is less than sixty degrees, (See Fig. 25) the teeth are often called needle shaped, and the Pruning Saw File (Page 10) should be employed in sharpening. In the latter case each side of a tooth is filed separately.

BAND SAWS

Narrow Band Saws are often found in the farm workshop. They are usually sharpened by machine in the saw servicing shop, but they can be

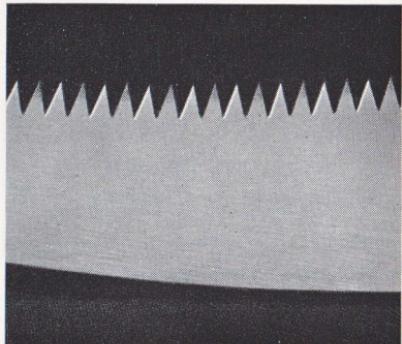


Fig. 25—Needle Shaped Pruning Saw Teeth

filed by hand. The Band Saw should be placed on a long bench with the teeth facing up and one section held in a vise. A handsaw vise is helpful, since a long section of teeth is held at one time. First, the tops of the band saw teeth are jointed lightly by running a file lengthwise across them. This makes the height uniform and serves as a guide for the filing. Setting is the next operation and is accomplished with the "sawset." Only the top third of each tooth is set, and five thousandths of an inch to a side is usually sufficient. (See Fig. 26).

NARROW BAND SAW

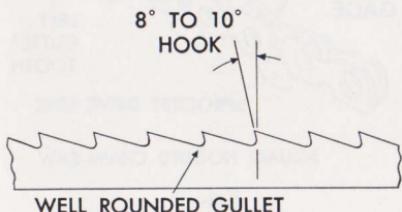


Fig. 26

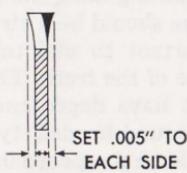


Fig. 26

A Bandsaw File which has rounded edges should be used to sharpen Narrow Bandsaws. The correct file to use is the 6" Bandsaw Taper No. 63 for 3 and 4 point band saws or the 6" Bandsaw Taper No. 64 for 5, 6 and 7 point band saws. If a conventional square-edge file is employed, it creates a sharp corner in the bottom of the saw tooth gullet. Subsequently, as the saw is used, a crack will form from this sharp corner and the saw will break. The round edged Bandsaw File maintains the round gullet of the saw and prevents breakage. (See Fig. 26). The file is then placed in the gullet between the teeth and allowed to find its own bearing against the back of one tooth and the face of the next. It is held level and stroked through at right angles to the saw blade until the jointing flats have been removed. The face of Narrow Band saw teeth should pitch forward at an angle of approximately ten degrees with the vertical.

SHARPENING CHAIN SAWS

Chain saw teeth may be grouped into three general types, and almost all brands of Chain saws use one of these types or a variation of them. A different kind of file is used to sharpen each type of Chain saw tooth. It is not considered to be good practice to sharpen Chain saw teeth on the saw bar because they are not supported rigidly and the filings will shorten chain and bar life if allowed to circulate in the mechanism during operation. Each Chain saw manufacturer can supply a vise specially designed to hold his particular chain.

ROUND-HOODED CHAIN SAW TEETH

(See Fig. 27) Require Round Chain Saw Files which are specially designed

for this use. These files are made in various diameters to fit all sizes of Round-hooded Chain saw teeth. The saw teeth face to both sides and provide their own clearance, so setting is not necessary. The file is placed against the beveled cutting edge surface of the tooth at an angle of from 25° to 45° with the saw blade. The direction of the filing stroke is off the cutting edge. It is essential that the file be held level, and it should be pressed back and slightly up during the filing stroke. Every other tooth is filed, and then the saw is reversed to complete the job. The depth gauges

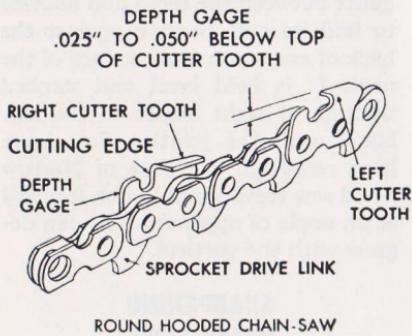


Fig. 27

on this type of saw (See Fig. 27) control the depth of cut that the saw will take. As the cutting teeth are sharpened they become lower, and it is necessary to lower the depth gauges an equal amount. The difference in height between cutting teeth and depth gauge should be between $.025"$ and $.050$ of an inch. The choice within this range depends on the design of the teeth and the hardness of the wood being cut. On harder woods a small clearance is used and on soft woods a larger clearance is best. This can be measured by placing a file on top of two cutting teeth and using a feeler gauge between the enclosed depth gauge and file. Some chain saw manufacturers provide a special tool for this use. If the depth gauge is too

high, it should be filed down with a Mill File making certain that the forward edge is rounded to prevent gouging and a rough-running chain.

SQUARE-HOODED CHAIN SAW TEETH

These saw teeth are sharpened with either a Lozenge Chain Saw File or a Square Chain Saw File. The Lozenge shape is usually preferred, for it is easier to maintain the angles of the saw teeth with this file. The chain has right and left-hand cutters (See Fig. 28) which provide their own clearance, so no setting is necessary. Each tooth has two cutting surfaces which intersect at approximately 90 degrees. (See Fig. 28). The direction of the filing stroke should be off the cutting edge. The file is placed under the hood so that two adjacent sides of the file contact both of the saw tooth cutting edges at one time. The axis of

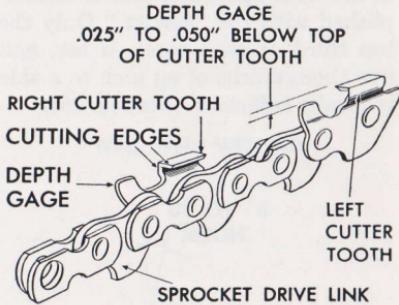


Fig. 28

the file must be tilted down and back, and during filing the direction of the stroke should be a straight line. It is important to maintain the original shape of the teeth. These Chain Saw teeth have depth gauges similar to the round-hooded type, and these should be sharpened in a similar manner (See description under Fig. 27).

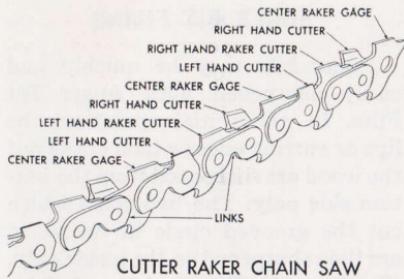


Fig. 29

CUTTER-RAKER CHAIN SAW TEETH

The arrangement of teeth on these saws varies considerably, but they all have a combination of cutter teeth and raker teeth. The cutter teeth are on the outside, and the uppermost part is a sharp point (See Fig. 29). They are already set and provide the clearance for the chain. There are three types of rakers in the chain depicted here, a left, center, and

right raker. A Flat Chain Saw file with round edges is recommended for the cutter-raker type of Chain Saw. The following are the important sharpening hints:

1. Jointing is necessary if the chain is badly worn.
2. The cutting teeth should be filed on the face only to bring up the sharp point.
3. The tops of the side rakers should be about $\frac{1}{64}$ of an inch below, and the tops of the center raker should be $\frac{1}{32}$ of an inch below the tops of the cutting teeth. If it is necessary to lower the rakers considerably, the tops may be filed, but normally the faces only are filed.
4. In general, the original angles on the teeth, both bevel and hook, should be maintained, but in some cases, may be varied slightly from the original, for different densities of woods.

FARM TOOLS AND IMPLEMENTS . . . their upkeep

In addition to saw filing, files are used all over the farm. Their comparatively small size and uncomplicated shape permit their being carried to every job. Thus, for many touch-up operations in the field, they serve *on the spot*. It is not necessary to return to the farm shop for most work of an upkeep or minor repair nature. Let's consider the file in relationship to many farm implement sharpening operations:

SHARPENING FARM TOOLS

Among the many tools requiring sharpening, are: mowing machine knives, silage cutters, pruning shears, hedge clippers, scythe and sickle blades, axes, hatchets, adzes, and a variety of chisels, etc. Such farm tools have cutting edges. To do their work properly, and in a minimum of time,

they must be sharp, free of bruises and in good workable condition at all times. In the following paragraphs are given suggestions for sharpening various edged tools. As this material is studied, the reader may wish to refer back to pages 9 to 18 in which the appropriate files are illustrated and described in detail.



Fig. 30—Sharpening Axe

SHARPENING AXES, HATCHETS AND ADZES

They may be held in a vise or laid down on a bench, truck running board or tail board, and held firmly with one hand. Filing may then be done either "toward" or "away" from the edge. A good practice is to file off the edge with a 10" Flat Bastard to remove any nicks and to file towards the edge with a 10" Mill Bastard as a finishing operation (See Fig. 30). This procedure minimizes the danger of cutting the hand during the heavy filing and eliminates the formation of an edge bur during the final sharpening.

SHARPENING MOWER KNIVES

In the sharpening of mower knives care should be exercised to preserve the original bevel from the point of the tooth to the angle of the gullet (See Fig. 31). Here again, the Mill Bastard File should be employed, Mower knife guards, as well as those on harvesters, should be filed occasionally to keep the points sharp and prevent "seizing".

AUGER BIT FILING

Auger bits may be quickly and easily sharpened with Auger Bit Files. In the initial operation, the lips or cutting edges which chisel out the wood are sharpened from the bottom side only. The two spurs which cut the grooved circle in the wood are then sharpened on the inside only. (See Fig. 32). The double ended tapered design of the Auger Bit File (See Page 18) permits sharpening the lips of small diameter bits, using that end of the file that has file teeth on the edges only. The bit may either be held in a vise or in the



Fig. 31—Sharpening Mower Knives

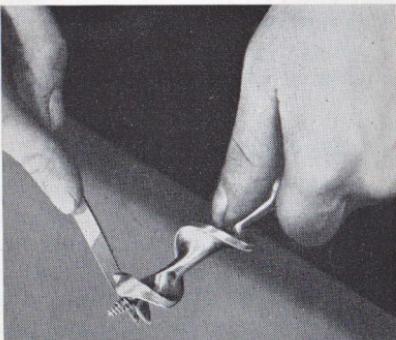


Fig. 32—Sharpening Auger Bit



Fig. 33—Sharpening Hoe

hand against the work bench edge and at a convenient angle, whichever way is preferred.

SHARPENING KNIVES, ETC.

In the farm home, the sharpening of knives, shears, etc. opens an additional wide field for file usage. Second Cut or Smooth Cut Mill Files produce the fine cutting edges needed for such hardware.

EDGING FARM IMPLEMENTS

For peak efficiency, hoes, spades, shovels, mattocks and pickaxes will do their work better, easier and in less time if their edges are maintained in good condition. This is true, likewise, of plowshares, seed-drill and cultivator shovels, harrow spring-teeth and discs. Damaged working surfaces of such implements can be returned to their original point of efficiency by the use of the file. (See Fig. 33).

In many cases and, unless the damage is severe, the latter group need not be removed from the basic equip-

ment. They can be touched up and conditioned in position. The hand tools mentioned above, can, of course, be re-edged and require only a few moments work, or "time out", with the convenient file carried to the job. In any of these edging operations, the Mill Bastard File is the popular one.

RASPS FOR FAST REMOVAL OF WOOD, SOFT METALS, HORSESHOEING

On the farm there are innumerable places where the Rasp will conserve time and energy. In fitting doors or gates wood may be removed quickly and efficiently with a Rasp, and often without the necessity of taking the work off its hinges. They may be used for rounding wood stock as in the case of farm wagon tongues, single-trees, ax, shovel, hoe and other wooden tool handles.

In carpentry work on the farm the Rasp is used to bring mortise-and-tenon joints to a proper fit (See Fig. 34); to smoothen end grain cuts that have a rough finish.

In horseshoeing the Horse Rasp is employed. These are cut with Rasp



Fig. 34—Using Rasp on Wood

teeth on one side and file teeth on the other. The rasp teeth are used for roughing and the file teeth for smoothing. The double ender is the more popular style. It permits a forward action from either end.

The life of a Rasp extends beyond its original use. When dulled or badly worn, the farmer finds them ideal in

forge work for quickly bringing rough shapes of red or white hot metal to the desired form.

Many plumbing chores in farm work offer ideal opportunities for the use of the Rasp, i.e., for filing of lead pipe, roughing of solder joints, and end finishing of softer metal piping or tubing.

FILE CARE AND CLEANERS

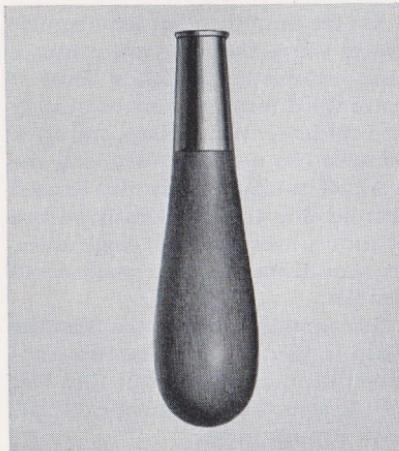


Fig. 35—File Handle

To get the longest life and most efficient usage from your farm files, there are certain simple precautions required for their care.

Each tanged file should be fitted with a Nicholson Metal Ferruled File Handle. These are made from seasoned white birch, correctly turned and finished. A properly fitted, carefully selected handle substantially increases the efficiency of the file or rasp. (See Fig. 35). File handles must fit tightly and snugly and should cover from three-fourths to seven-eighths of the tang.

Files should never be thrown loosely into a tool drawer or box nor

should they be laid on top of each other or stacked together. It should be remembered that a file is an abrading tool provided with cutting teeth, and that handling them in the manner described, dulls them, breaks the teeth and shortens their life. For the proper care of your files, a rack should be provided in your workshop similar to the one illustrated. (See Fig. 36). This keeps them separated, orderly, and avoids damaging the various file surfaces.

In use a file collects chips of whatever material is being cut. If permitted to accumulate, they pack in the gullets between the teeth so that the file slips over the work rather than cutting into it. Slipping dulls the file. The teeth should therefore be kept cutting at all times. The experienced filer will tap the end of the

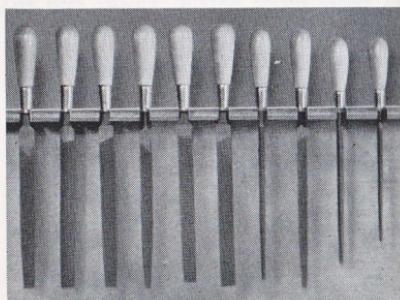


Fig. 36—File Storage Rack

file on the bench after every few strokes, to loosen the chips and free them. Oil and grease should be removed from the file with the use of chalk, after which the file is brushed.

In addition to the technique just

explained, a File Card or Brush should be part of the farm's standard equipment. With them the teeth of the file should be brushed frequently, and always immediately after a job of filing is completed. (See Fig. 37).



Fig. 37—File Card and Brush

Herein you have read the basic story of **FILES FOR THE FARM**, which to select; where they are used; and, how to use them. It is our hope that you have found the book instructive and helpful and that you will keep it over the years for reference in the many matters of farm filing which, in total, are so important a part of efficient farm operation.

N I C H O L S O N F I L E C O M P A N Y
P R O V I D E N C E I., R. I., U. S. A.

In Canada: Nicholson File Company of Canada Ltd., Port Hope, Ontario

